Listing of Claims:

Please amend the claims to read as follows:

Claim 1 (currently amended): An apparatus for regulating the flow of a gas between a high-pressure zone and a zone of lower pressure, said apparatus comprising:

a hollow body having an axis;

a first chamber and a second chamber, said chambers defined within said body;

a nozzle within said body and separating said chambers, said nozzle comprising a convexly curved wall, and defining a passage for the passage of gas between said chambers; and

a stem movable axially within said passage and comprising:

a distal portion extending at least partially into said first chamber;

a proximate portion within said second chamber and extending into said passage, wherein axial movement of said stem varies the position of said proximate portion in relation to said nozzle; and

an o-ring seat between said proximate portion and said distal portion of said stem and contactable with said nozzle to seal said passage against the passage of gas.

Claims 2-40: (previously canceled)

Claim 41: CANCELED

Claim 42 (currently amended): An apparatus according to claim ~~41~~ 1 wherein said curved wall is defined by a long radius arc and said nozzle comprises a minimum diameter.

Claim 43 (previously added): An apparatus according to claim 42 wherein the ratio of said long radius to said nozzle minimum diameter is between approximately 2.53:1 and approximately 2.27:1.

Claim 44 (previously added): An apparatus according to claim 42 wherein a diameter of said proximate portion of said stem is at least 98% of said nozzle minimum diameter.

Claim 45 (previously added): An apparatus according to claim 44 further comprising means defined in said stem for providing gas flow area between said stem and said nozzle.

Claim 46 (previously added): An apparatus according to claim 45 wherein said means for providing gas flow area comprises stem flow grooves defined in said proximate portion.

Claim 47 (previously added): An apparatus according to claim 1 wherein said distal portion is removably connectable to said proximate portion of said stem and wherein, when connected, said distal portion and said proximate portion define an annular pocket for receiving said o-ring seat.

Claim 48 (previously added): An apparatus according to claim 47 wherein said distal portion and said proximate portion have a screwed engagement, and wherein when fully engaged said distal portion and said proximate portion squeeze said seat and capture said seat within said pocket.

Claim 49 (previously added): An apparatus according to claim 48 wherein less than one third of the toroidal circumference of said seat is exposed outside said pocket.

Claim 50 (previously added): An apparatus according to claim 48 wherein said o-ring seat comprises an axial cross-sectional area, and said pocket defines an axial cross sectional area from about 7% to about 10% larger than said cross-sectional area of said seat, wherein when said seat is squeezed in said pocket a void is defined in said pocket between said seat and said stem.

Claim 51 (previously added): An apparatus according to claim 50 further comprising a vent hole defined in said stem for providing fluid communication between said pocket and said second chamber for balancing pressures between said pocket and said second chamber.

Claim 52 (previously added): An apparatus according to claim 50 wherein said seat comprises a polymer selected from the group consisting of PTFE Teflon® polymer, CTFE Neoflon® polymer, and Viton® polymer.

Claim 53 (previously added): An apparatus according to claim 50 further comprising:

an axially directed guide hole defined between said body and said proximate portion of said stem; and

a guide pin inserted in said guide hole thereby to prevent rotation of said proximate portion around said axis.

Claim 54 (previously added): An apparatus according to claim 1 further comprising means for regulating pressure in said second chamber.

Claim 55 (previously added): An apparatus according to claim 54 wherein said means for regulating pressure comprises:

a spring flange movably disposed within said body;

a disk member positionally fixed within said body, said spring flange and said disk member defining there-between an interstage chamber; and

an axially symmetric shaft passing through a portal in said fixed disk and through said interstage chamber to separably connect said spring flange to said stem.

Claim 56 (previously added): An apparatus according to claim 55 further comprising an internal seal for precluding fluid flow past said disk member.

Claim 57 (previously added): An apparatus according to claim 56 further comprising a gasket seal on the distal side of said fixed disk for precluding fluid flow radially past said distal side.

Claim 58 (previously added): An apparatus according to claim 57 further comprising a piston conduit for conveying pressure from said first chamber to a proximate end of said proximate stem portion.

Claim 59 (previously added): An apparatus according to claim 58 further comprising a balancing conduit for conveying the fluid pressure from said second chamber and past said disk member to said interstage chamber.

Claim 60 (previously added): An apparatus according to claim 59 further comprising a snap ring means, engageable with a circumferential grove in said body, for holding said disk member in position.

Claim 61 (previously added): An apparatus according to claim 60 wherein said spring flange is separably connected to a proximate end of said axially symmetric shaft, thereby fixably connecting said spring flange to said stem.

Claim 62 (previously added): An apparatus according to claim 61 further comprising:

a threaded barrel member defining a central portal in its bottom; and

an axial extension from said spring flange;

wherein said extension of said spring flange passes through said portal, and said extension is free to slide within the portal.

Claim 63 (previously added): An apparatus according to claim 62 further comprising flexible biasing means disposed axially between said barrel and a proximal side of said spring flange, wherein controlled compression of said biasing means selectively adjusts the force balance on said spring flange, thereby regulating pressure in said second chamber.

Claim 64 (previously added): An apparatus according to claim 1 wherein said proximate portion of said stem comprises a threaded means for separably attaching said stem to an adjustment handle, said threaded means comprising barrel means for containing thread wear debris.

Claim 65 (previously added): An apparatus according to claim 64 wherein said proximate portion of said stem defines an external groove for mating with a non-rotational guide pin.

Claim 66 (previously added): An apparatus according to claim 65 wherein said hollow body defines, adjacent said proximate stem portion, an internal groove for mating with a non-rotational guide pin.

Claim 67 (previously added): An apparatus according to claim 66 further comprising a guide pin insertable through a top of said body for mating with said stem external groove and said body internal groove throughout the axial stroke of said stem.

Claim 68 (currently amended): An apparatus for regulating the flow of a gas between a high-pressure zone and a zone of lower pressure, said apparatus comprising:

a hollow body having an axis;

a first chamber and a second chamber, said chambers defined within said body;

a nozzle within said body and separating said chambers, said nozzle defining a passage for the passage of gas between said chambers;

a stem movable axially within said passage and comprising:

a distal portion extending at least partially into said first chamber;

a proximate portion within said second chamber and extending into said passage, wherein axial movement of said stem varies the position of said proximate portion in relation to said nozzle; and

an o-ring seat between said proximate portion and said distal portion of said stem and contactable with said nozzle to seal said passage against the passage of gas; and

means for regulating pressure in said second chamber, comprising:

a spring flange movably disposed within said body;

a disk member positionally fixed within said body, said spring flange and said disk member defining there-between an interstage chamber; and

an axially symmetric shaft passing through a portal in said fixed disk member and through said interstage chamber to separably connect said spring flange to said stem.

Claim 69 CANCELED

Claim 70 (currently amended): An apparatus according to claim ~~69~~ 68 further comprising an internal seal for precluding fluid flow past said disk member.

Claim 71 (currently amended): An apparatus according to claim ~~69~~ 68 further comprising a gasket seal on the distal side of said disk member for precluding fluid flow radially past said distal side.

Claim 72 (currently amended): An apparatus according to claim ~~69~~ 68 further comprising a piston conduit for conveying pressure from said first chamber to a proximate end of said proximate stem portion.

Claim 73 (previously added): An apparatus according to claim 72 further comprising a balancing conduit for conveying the fluid pressure from said second chamber and past said disk member to said interstage chamber.

Claim 74 (previously added): An apparatus according to claim 73 further comprising a snap ring means, engageable with a circumferential grove in said body, for holding said disk member in position.

Claim 75 (previously added): An apparatus according to claim 73 wherein said spring flange is separably connected to a proximate end of said axially symmetric shaft, thereby fixably connecting said spring flange to said stem.

Claim 76 (previously added): An apparatus according to claim 75 further comprising:

a threaded barrel member defining a central portal in its bottom; and

an axial extension from said spring flange;

wherein said extension of said spring flange passes through said portal, and said extension is free to slide within the portal.

Claim 77 (previously added): An apparatus according to claim 76 further comprising flexible biasing means disposed axially between said barrel and a proximal side of said spring flange, wherein controlled compression of said biasing means selectively adjusts the force balance on said spring flange, thereby regulating pressure in said second chamber.

Claim 78 (previously added): An apparatus for regulating the flow of a gas between a high-pressure zone and a zone of lower pressure, said apparatus comprising:

a hollow body having an axis;

a first chamber and a second chamber, said chambers defined within said body;

a nozzle defined by a convexly curved wall within said body and separating said chambers, said nozzle defining a passage for the passage of gas between said chambers; and

a stem movable axially within said passage and comprising:

a distal portion extending at least partially into said first chamber;

a proximate portion within said second chamber and extending into said passage, wherein axial movement of said stem varies the position of said proximate portion in relation to said nozzle; and

an o-ring seat between said proximate portion and said distal portion of said stem and contactable with said nozzle to seal said passage against the passage of gas.

Claim 79 (previously added): An apparatus according to claim 78 wherein said curved wall is defined by a long radius arc and said nozzle comprises a minimum diameter.

Claim 80 (previously added): An apparatus according to claim 79 wherein the ratio of said long radius to said nozzle minimum diameter is between approximately 2.53:1 and approximately 2.27:1.

Claim 81 (previously added): An apparatus according to claim 79 wherein a diameter of said proximate portion of said stem is at least 98% of said nozzle minimum diameter.

Claim 82 (previously added): An apparatus according to claim 79 further comprising stem flow grooves defined in said proximate portion for providing gas flow area between said stem and said nozzle.

Claim 83 (currently amended): An apparatus for regulating the flow of a gas between a high-pressure zone and a zone of lower pressure, said apparatus comprising:

a hollow body having an axis;

a first chamber <u>defining at least in part said high-pressure zone,</u> and a second chamber, said chambers defined within said body;

a nozzle within said body and separating said chambers, said nozzle defining a passage for the passage of gas between said chambers; and

a stem movable axially within said passage and comprising:

a distal portion extending at least partially into said first chamber;

a proximate portion within said second chamber and extending into said passage, wherein axial movement of said stem varies the position of said proximate portion in relation to said nozzle; and

an o-ring seat between said proximate portion and said distal portion of said stem and contactable with said nozzle to seal said passage against the passage of gas; wherein said distal portion is removably connectable to said proximate portion of said stem and wherein, when connected, said distal portion and said proximate portion define an annular pocket for receiving said o-ring seat, said pocket having a void radially inward from said o-ring seat and between said seat and said stem;

and wherein further said proximate portion is separated from said first chamber by said distal portion and said o-ring seat, whereby to isolate said void from said high-pressure zone.

Claim 84 (previously added): An apparatus according to claim 83 wherein said distal portion and said proximate portion have a screwed engagement, and wherein when fully engaged said distal portion and said proximate portion squeeze said seat and capture said seat within said pocket.

Claim 85 (previously added): An apparatus according to claim 84 wherein less than one third of the toroidal circumference of said seat is exposed outside said pocket.

Claim 86 (currently amended): An apparatus according to claim 85 wherein said o-ring seat comprises an axial cross-sectional area, and said pocket defines an axial cross sectional area from about 7% to about 10% larger than said cross-sectional area of said seat, wherein when said seat is squeezed in said pocket ~~a~~ said void is defined in said pocket between said seat and said stem.

Claim 87 (previously added): An apparatus according to claim 86 further comprising a vent hole defined in said stem for providing fluid communication between said pocket and said second chamber for balancing pressures between said pocket and said second chamber.

Claim 88 (previously added): An apparatus according to claim 86 wherein said seat comprises a polymer selected from the group consisting of PTFE Teflon® polymer, CTFE Neoflon® polymer, and Viton® polymer.

Claim 89 (currently amended): An apparatus for regulating the flow of a gas between a high-pressure zone and a zone of lower pressure, said apparatus comprising:

a hollow body having an axis;

an adjustment handle;

a first chamber and a second chamber, said chambers defined within said body;

a nozzle within said body and separating said chambers, said nozzle having a minimum diameter and defining a passage for the passage of gas between said chambers; and

a stem movable axially within said passage and comprising:

a distal portion having a diameter less than said minimum diameter of said nozzle, said distal portion extending at least partially into said first chamber;

a proximate portion, within said second chamber, removably connectable to said distal portion and extending into said passage, wherein axial movement of said stem varies the position of said proximate portion in relation to said nozzle; and

an o-ring seat between said proximate portion and said distal portion of said stem and contactable with said nozzle to seal said passage against the passage of gas.

Claim 90 (previously added): An apparatus according to claim 89 wherein said proximate portion of said stem comprises a threaded means for separably attaching said stem to said adjustment handle, said threaded means comprising barrel means for containing thread wear debris.

Claim 91 (previously added): An apparatus according to claim 90 wherein said proximate portion of said stem defines an external groove for mating with a non-rotational guide pin.

Claim 92 (previously added): An apparatus according to claim 91 wherein said hollow body defines, adjacent said proximate stem portion, an internal groove for mating with a non-rotational guide pin.

Claim 93 (previously added): An apparatus according to claim 92 further comprising a guide pin insertable through a top of said body for mating with said stem external groove and said body internal groove throughout the axial stroke of said stem.